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ABSTRACT

The purpose of this article is to show how traditional science fiction, an empowering literature of social criticism, can be used by environmental educators to reach the traditional goals of environmental education. The sub-genres of science fiction are discussed along with ways in which they can be used to reach certain goals of environmental education. Planetary exploration, a sub-genre of science fiction, is compared to exploring and managing terrestrial wild frontiers and a case is made for using it to reach the goals of environmental education. Imaginative science fiction writing concerning Mars, a genre which reflects a changing environmental consciousness, is also discussed. (JRH)

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EXPLORING MARS AND BEYOND:

Science Fiction a Resource for Environmental Education

by

Ryder W. Miller

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Exploring Mars and Beyond: Science Fiction a resource for Environmental Education.

by Ryder W. Miller (graduate in Environmental Education at CSU Hayward).

The purpose of this article is to show how traditional science fiction, an empowering literature of social criticism, can be used by environmental educators to reach the traditional goals of environmental education. First I will describe why science fiction is useful for this purpose. Second I will describe how the sub-genres of SF can be used to reach certain goals of environmental education. Then I will explore planetary exploration as another sub-genre of science fiction and point out it is not very different than exploring and managing terrestrial wild frontiers and therefore also useful for reaching the goals of environmental education. Finally, I will explore the imaginative science fiction writings concerning Mars, which reflect a changing environmental consciousness, thereby illustrating who we are and where we have been.

Science fiction, a relatively new genre of literature, has both its supporters and detractors. David Pringle, the author of Science Fiction:The Hundred Best Novels, mentions many of the criticisms. He points out that only ten or twelve novels in the genre can be considered literary masterpieces; that false generalizations exist that SF consists almost entirely of stories about space travel; is "inherently childish"; and consists for the most part of doom-ladden horror stories about disaster and dissolution. But despite its perceived failings, science fiction is a unique genre, with a strong following, that can be very useful for environmental educators.

Brian Aldiss, famous science fiction writer, in his history of science fiction: The Trillion Year Spree, writes "Science fiction is one of the major literary success areas of the second half of the twentieth century."

Aldiss also points out that science fiction readers are not surprised by technological developments that shock others. He has written: "When the space race came and changed everything, only SF readers were prepared for the event; just as, some two decades earlier, they were among the least surprised by the invention of the A-bomb (which also changed everything)."

Science fiction literature can be a means to introduce environmental education into the high school English classroom. It is also popular and sought out by students. Award winning science fiction writer Ursula Le Guin has stated that she doesn't believe that students should be forced to read SF. But they would probably appreciate an opportunity to do so. Famous science fiction writer Isaac Asimov has long insisted "that science fiction has potential as an inspiring and useful teaching device."

Science fiction can be a useful educational tool because it is filled with thought experiments and extrapolation. Science fiction relates to speculation and forecasting, and is a fertile

starting point for debate and discussion-which makes it a useful tool for working towards the higher level goals of environmental education, i.e. planning and evaluation. The work can be as clear as: if we do this then that will happen. It is also a literature that relates to science and therefore focuses on the appropriate subject matter of environmental education. Stories, movies, and passages can all be starting points for discussion, transmitting knowledge, and teaching skills.

An important aspect of science fiction is its assertion that we live in changing times and we are collectively in the driver's seat.

Brian Stableford in The Science Fiction Source Book writes: "...it is the characteristic of modern times that within the span of a single lifetime the world is likely to be transformed by technological advancement. Most of the themes of science fiction arise out of that realization.... It can remind us, too, that the path we actually take through the wilderness of if is one that we choose by the exercise of our collective will-and that we must therefore be careful in that exercise."

Works within this genres can be used to make certain points, explore certain topics and illustrate certain concepts. Works in this field can also be empowering, thereby effecting attitudes, behavior and values. As such, science fiction can be used to reach the goals of environmental education, including: knowledge, attitudes, awareness, behaviors, and values.

Using the Sub Genres of Science Fiction

In The Science Fiction Source Book Stableford goes on to breaks down science fiction into fifteen subgenres, seven of which are useful for our purposes, namely: Aliens, Alien Ecologies, Disasters, Man and Machines, Utopia and Dystopia, Time Travel, and Parallel Worlds and Alternate Histories. I will also introduce another: Planetary Exploration which also provides useful educational opportunities. Other useful sub-genres of science fiction, with descriptions and references can be found in The Encyclopedia of Science Fiction edited by John Clute and Peter Nicholls.

The purpose here is not to explore each sub-genre in depth or to reference the famous work from each (a good starting point to do so would be The Encyclopedia of Science Fiction), but rather to touch on what they focus on and to mention a number of ways in which they can be used to reach the goals of environmental education.

Aliens

Thinking about aliens from other planets can teach us about natural science, and ourselves. Just as terrestrial life forms have adapted through evolution to living on Earth, so would have alien life forms on another planet. They would also be subject to the same ecological laws that govern terrestrial life forms. Since aliens are imagined one could examine the considerations of the authors who have created them. Since the 1930's science fiction

authors have taken extra care to make sure that aliens are plausible. Their concerns have been trying to be logical, scientific, and believable.

Imaginary encounters with intelligent aliens provide an opportunity to judge ourselves by all manner of standards. We can see how we are judged by aliens from other planets or how human societies compare to other alien societies. An important subject for evaluation is how we have treated the terrestrial wildlife we have encountered on our planet. What does this portend for possible future experiences with life forms from another planet? This work is useful because much of it harshly judges the machinations of Western Society.

Alien Ecologies

Ecological laws will operate on other planets. Exploring alien ecologies provides an opportunity to see the workings of ecological laws in imagined situations. Basic exercises relating to food webs and food chains can also be diagramed from imaginary ecosystems. Artistry has provided the opportunity to create habitats that are shaped by selected conditions-which can be explored. Works can focus on fragile interrelationships which humans are a part of, or harmonious ecological situations. There are also "ecological puzzle stories" where the protagonist needs to learn about the ecology in order to solve environmental problems.

Dune is a famous example of an imagined world with its own ecology. Star Trek IV: The Return Home is particularly interesting because it depicts an extraterrestrial ecological connection.

Disasters

Stories about catastrophes can point out the need for an active and involved populace. Works within this genre can point out to students the need for them to be active citizens, that problems arise from certain behaviors, and many problems are solvable. The focus of British SF on disasters has helped it gain greater respectability than SF written in the United States.

Much of this writing focuses on man-made disasters providing an opportunity for presenting moral arguments and preaching messages. We do not need to look too far to find potential disasters. Nuclear war is one scenario, but many of the pressing environmental problems provide the roots for future disaster scenarios. The Encyclopedia of Science Fiction describes and references works with the themes Pollution and Overpopulation.

Man and Machines

Stories about man and machines can examine the dubiousness of "progress". Technological development seems to imply the ability to create a better future. Technology can also provide the means to repair or design future environments. But technology can also be blamed for pollution or the use of more advanced ways to alter the environment. What the student can get from the examination of this work is that it is we, the collective, who are ultimately

responsible for what are creations are used for and what they do. This has been examined in writings about intelligent artificial life forms and robots. Technology is not a Pandora's box, but a similar box that we open again and again.

Gough (1993) stresses the value of cyberpunk science fiction which is popular and topical. This literature examines what it is to be human in an age where technology has become an integral part of human ecology. But for our purposes, how technology affects our lives is less a concern than how the use of technology affects our environment.

Utopia-Dystopia
Time Travel
Parallel Worlds and Alternate Histories

Though slightly different, these sub-genres are linked together because they can be used to reach the same goal: the need for people to feel empowered and be involved. Utopian and Dystopian writing concerns imagined societies, some of which are ideal (Utopian) and some of which are inhospitable and dangerous (Dystopian). Time travel stories allow imaginary tourism to different times, places and societies. Parallel worlds and alternative history writing allows one to imagine how things could have been or could be different. Exploring what might have been or could be shows important things are at stake. A string that ties these together is our need to acknowledge the importance of our role in creating the present and the future. This work, with its depictions of Utopias and Dystopias makes the point that people need to be in touch with trends in society. These sub genres all can be used for the purpose of driving home the point that society is changeable and designable.

Award winning writer Kim Stanley Robinson, in Future Primitive: the new ecotopias writes:

"Science fiction is a collection of thought experiments that propose scenarios of the future. All science fiction stories carry within them implicit histories connecting their futures back to our present. They are historical simulations, which start at the present and then state if we do this we will reach here, or if we do that we will reach there. It's a mode of thought that is utopian in its very operating principle, for it assumes that differences in our actions now will lead to real and somewhat predictable consequences later on-which means that what we do now matters. Science fiction is play that helps teach us how to act, like the wrestling of tiger cubs."

Planetary Exploration

We will now explore science fiction relating to Planetary Exploration, which one could argue is not that different than thinking about the exploration of a new terrestrial frontier. This work explores questions that are not that dissimilar from questions that we have recently faced. What would happen if we could go to another planet (or a new wild area)? What if the planet had life on it (what if we find life there?)? What if the planet had

intelligent life on it (or indigenous people or an advanced civilization?)? The discussion will focus on the planet Mars because these scenarios have been explored within the literature, and Mars is the second most habitable planet in the solar system and therefore the most likely to be colonized.

Recent scientific discoveries have shown that mass space travel is highly unlikely, because the distances between stars is enormous, and Mars was found to be lifeless. But one should remember that people once believed that we would never send a man to the moon, and the martian atmosphere was found to be more amenable to machinery than some parts of the globe-like the depths of the ocean.

Planetary exploration may be a possibility in the future, but for the present purposes it is important to recognize that thinking about how we treat wild areas on our globe may not be that different than thinking about what we should do with wild areas on other planets. Other planets are a possible source of danger but they are also vulnerable to our predilections. Environmental educators should ask their students what would we do to the desert field or forest or shoreline before us if it were on a colonized alien world? How different would the discussion be for the easily jaded? Trips in the wilderness or imagined wildernesses are not solely about exploration but also environmental planning and decision making.

Mars

Mars has long been important to the public and science fiction writers. A visible red spot in the sky, our most habitable neighbor in space has long been mysterious and a fertile ground for the imagination.

Mars at the turn of the century was believed to be the home of intelligent life. Due to a mistranslation of the Italian word "canali", meaning channels or grooves, used in the description of Mars by the astronomer Schiaparelli in 1877, people began to believe that constructed canals were seen on Mars. Since Mars was believed to be water poor the canals were believed to be the engineering of an advanced civilization, possibly striving to stave off a drought and environmental catastrophe. These stories have had an impact on science fiction and space exploration; many works of science fiction about Mars have incorporated elements of this story.

The body of work that exists, much of it famous, is a resource that environmental educators can use. Comparing recent works to older works can also show the changes in environmental consciousness that have occurred.

In H.G. Wells' The War of the Worlds (1898) the almost unstoppable Martians invade the Earth. For Edgar Rice Burroughs, Mars (1917-1943) was an adventure wonderland, with four armed giant swordsmen, canals, flying ships, and princesses. The hero John Carter, alone on Mars, was a warlord and adventurer. The Martian Odyssey (1934) by Stanley Weinbaum was considered a classic because it presented aliens that were truly alien and not earthlike, and since its publication science fiction authors took extra care to

think through their extraterrestrial creations. In Out of the Silent Planet (1938) by C.S. Lewis, we see unmasked in symbolic form those would misunderstand and plunder Mars, in the shapes of Weston who primarily believes in loyalty to species, and Devine, who is interested in profiting from the trip. In Ray Bradbury's The Martian Chronicles (1950) Mars was inhabited by an ancient society living in a pristine environment, but vulnerable to colonization. Reflecting the 1960's, in Robert Heinlein's Stranger in a Strange Land (1961), Michael Valentine Smith, who was raised by martians, becomes the leader of a religious movement which calls for a change on Earth. But of more importance is Kim Stanley Robinson's recent award winning novels Red Mars (1993) and Green Mars (1994), where the planet is, as we now know, barren and lifeless, but chosen for terraforming and planetary colonization.

We see at work in this literature the change from the dominant social paradigm (DSP)-which believes in progress, growth and technology as a cure all, to the new environmental paradigm (NEP)-which sees the earth as sort of a spaceship, ourselves as steward on a planet that is fragile and with limited resources, and argues that there are limits to growth (Dunlap and Van Liere, 1978). Exploring the science fiction writing about Mars is an exploration of our aspirations, fears, desires and short comings. The early works justify the Dominant Social Paradigm, with mankind being the underdog against the unknown, whether it is the invading martians or the wild creatures of Barsoom.

We see an argument against the Dominant Social Paradigm in Bradbury's work, probably the most useful at illustrating the need for a change. We see mankind at its worst in this scenarios, a mankind that would haphazardly destroy the martians through the importation of a disease, and then go on to destroy themselves. In affecting prose Bradbury tells what happens:

"They came to the strange blue lands and put their names upon the lands. Here was Hinkston Creek and Lustig Corners and Black River and Driscoll Forest and Peregrine Mountain and Wilder Town, all the names of people and the things that people did....and each of the other places where the rocket men had set down their fiery caldrons to burn the land the names were left like cinders....

The old Martian names were names of water and air and hills. They were the names of snows that emptied south in stone canals to fill the empty seas. And the names of sealed and buried sorcerers and towers and obelisks. And the rockets struck at the names like hammers, breaking away the marble into shale, shattering the crockery milstones that named the old towns, in the rubble of which great pylons were plunged with new names: IRON TOWN, STEEL TOWN, ALUMINUM CITY, TRIC VILLAGE, CORN TOWN, GRAIN VILLA, DETROIT II, all the mechanical names and the metal names from Earth.

....they came with stars and badges and rules and regulations, bringing some of the red tape that had crawled across Earth like an alien weed, and letting it grow on Mars wherever it could take root."

Though the other works mentioned are important, it is most important to contrast Bradbury's work with the recent work about

the colonization of Mars by Kim Stanley Robinson. In Robinson's work there is no alien society on Mars and the colonists are terraforming the barren surface. Some of the colonists in this work have the concerns of environmentalists.

Environmental educators should ask their students what will happen when we can go to Mars or other planets? The first trip may not be so far away. Former President Bush proposed the year 2019 to send the first manned mission to Mars. Why shouldn't the environmental history of Mars be a subject that environmental educators teach? There are living history programs, why not have future living programs or planet exploration exercises?

How about an exploring Mars program in the red sanded desert of the South West? This may save a failing program or provide impetus for a new one. The buses could be painted like space ships as could some of the buildings. Aliens, astronauts, martians and science fiction authors can come and give talks.

The issues that future space explorers will have to tackle are very similar issues we have faced in the past and we presently face. To the unaccustomed to the wilderness, or those use to other habitats, wild areas could seem very otherworldly and discussions relating to how to manage these areas will not be very different from discussions concerning how to manage "wild" places on other planets. Science fiction literature provides a resource for those interested in these and other educational goals.

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